

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Confirmation No.: 9560

Hideki MATSUDA et al.

Art Unit: 1793

Application No.: 10/527,318

Examiner: Jie YANG

Filed: March 10, 2005

Attorney Dckt No.: 027667-00001

For: MACHINE PART AND METHOD FOR MANUFACTURING SAME

REQUEST FOR RECONSIDERATION

MAIL STOP Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

March 13, 2008

Sir:

The Office Action dated November 13, 2007 has been received and carefully noted. The following remarks are being submitted, along with a Petition for Extension of Time, as a full and complete response thereto. Claims 1-10 are pending in this application. Reconsideration of the rejections of the claims is respectfully requested.

The Office Action rejects 1 and 6 under 35 U.S.C. § 103(a) as being obvious over Yiu Chen et al. (NPL; "Study on Microstructure and Properties of Softnitriding Layer in the Several Steels," Tianjin Metallurgy, Tianjin Institute of Technology; No. 4:2000; pages 9-12); claim 5 under 35 U.S.C. § 103(a) as being obvious over Chen and Ishida et al. (U.S. Patent No. 6,599,469); and claims 2-4 and 7-10 under 35 U.S.C. § 103(a) as being obvious over Chen in view of Ishida. The rejections are respectfully traversed.

In particular, the above-identified application claims a mechanical component, a method of fabricating the mechanical component, the mechanical component being composed out of steel and surface-hardened by nitriding, having a Vickers hardness of the surficial portion measured at a reference position corresponding to a 50 μ m depth from the surface of the mechanical component of 340 to 460 HV, having a Vickers hardness of the inner portion not affected by the nitriding of 190 to 260 HV, and having an effective depth of hardened layer measured from the surface of the component where a Vickers hardness of 270 HV is achieved of 0.3 mm or more, as recited in independent claim 1, and similarly recited in independent claim 6.

Chen teaches a study on microstructure and properties of soft-nitriding layers in several steels wherein the thickness, microstructure, microhardness, wear and corrosion-resistance of several steels that have been soft-nitrided have been studied (Abstract). However, the Office Action admits that Chen fails to disclose or suggest the features of independent claims 1 and 6 (Office Action, page 2, line 13-page 3, line 10), but argues that it would have been obvious to one skilled in the art “to have optimized composition of alloy and parameters of surface nitriding treatment in order to obtain desired Vickers hardness distribution” (page 3, lines 3-6). However, the Office Action is mistaken for the following reasons.

In support of the Office Action’s assertion, the Office Action cites M.P.E.P. § 2144.05. However, in the same section of the M.P.E.P. (M.P.E.P. § 2144.05, Chapter III), it is clearly stated that “the law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims,” and that “in particular, parameter must first be recognized

as a result effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.”

The Office Action asserts that the result-effective variable is the alloy composition and the parameters are surface nitriding treatment, and that the result sought is Vickers hardness of surficial portion and distribution of hardness along depth profile (Office Action, page 2, lines 14-16). However, this recitation is taken directly from Applicants’ disclosure. Furthermore, a closer examination of Chen reveals that Chen merely teaches that “better” hardness (depending on what is desired) can be achieved for the two alloys that have been self-nitrided than for the 45 steel, as evidenced in the table in Chen and plots 2, 3 and 4. However, in Chen, there is no teaching of an increase in the surface-hardness and an increase in the bend straightening property of the alloys, which are some of the results sought by the claimed composition of the mechanical component, as indicated in the Specification at, for example, page 4, lines 15-23. Thus, Chen does not teach that the result that is sought is both surface-hardness and bend straightening property, and thus does not identify a recognized result. If the Patent Office’s assertion is correct that merely teaching self-nitriding of several steel alloys would be a sufficient basis to invalidate a specific composition aimed at increasing both the hardness of the steel and its bend straightening property, then any reference, including any technical dictionary, that teaches soft-nitriding would be a sufficient basis to invalidate Applicants’ invention.

Accordingly, because there is no teaching in Chen that the results that are sought are not only hardness of the steel but also increasing in bend straightening

properties, the specific claimed limitation of a Vickers hardness measured at a 50 μm depth of 340 to 460 HV, combined with a Vickers hardness in a portion not affected by nitriding of 190 to 260 HV, and combined with an effective depth of the hardening layer with a Vickers hardness of 270 HV is achieved of 0.3 mm or more, is not taught or suggested by the teachings of Chen.

Accordingly, Chen fails to disclose or suggest the features of independent claims 1 and 6.

Claims 2-5 and 7-10, at least for their dependence on independent claims 1 and 6, and for their added limitations, are also patentable over the Chen.

Ishida teaches a non-heat treated steel for soft nitriding that can provide forged parts and that exhibits equal to or larger than the limit strain at which a crack occurs in straightening by bending (Abstract). Ishida does not teach providing both hardness of the steel and bend straightening properties. Even if the composition ranges taught in Ishida overlapped with the claimed ranges, which Applicants do not admit, Ishida fails to disclose or suggest a Cr equivalent value as defined in claim 2 of 0.72% or more and 1.0% or less. Ishida only teaches, as shown in Table 1, a Cr equivalent value of less than 0.72%. Accordingly, Ishida does not disclose or suggest having a Cr equivalent value, which could be indicative of an increase in hardness, as a parameter, or indicate the importance of a relationship between the various chemical components such as C, Si, Mn and Cr. Thus, there would be no motivation to combine Ishida with Chen, and Ishida fails to cure deficiencies in Chen in disclosing or rendering obvious the features of claims 2-5 and 7-10, including the above-discussed features of independent claims 1 and 6.

For at least these reasons, claims 1 and 10 are patentable over the applied references. Thus, withdrawal of the rejections of the claims under 35 U.S.C. § 103(a) is respectfully requested.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Dkt. No. 027667-00001.**

Respectfully submitted,



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Attachment: Petition for Extension of Time (one month)

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